to changes in tariff levels of other carriers, while MCI and Sprint have generated relatively large (same-direction, or collusive) changes in response to AT&T tariff changes. The assumption here is that the historical average values for the conjectural variations are maintained after the entry of Ameritech. The assumption also is that Ameritech's conjectural variation is zero, the classical assumed value for a firm with a noncooperative pricing strategy.

92. The average conjectural variation and post-entry market share estimates are then used in a four-step procedure to estimate gains in consumer welfare. In the first step, the post-entry market shares reported in Table Twelve are used to estimate the post-entry HHI; second, the HHI in conjunction with an estimated demand elasticity (taken to be -0.70) and conjectural variations are used to estimate post-entry price-cost margins.[51] The third step takes the post-entry price from the price-cost margin to calculate the percentage decrease in prices and increases in quantities, and the final step uses these values to estimate benefits (areas A and B in the diagram).

Davis, Gerald J. Caccappolo and Muhammed Ali Chaudry, *An Econometric Planning Model for American Telephone and Telegraph Company*, 4 BELL JOURNAL OF ECONOMICS AND MANAGEMENT SCIENCE 26 (1973). These assumptions resulted in increases in estimated average conjectural variations of 0.12, 0.37 and 0.39 for AT&T, MCI and Sprint, respectively.

[51] The formula for calculating the industry average price-cost margin is as follows:

$$L=\sum_{i=1}^{n} s_i L_i=\frac{HHI+\sum_{i=1}^{n} v_i s_i^2}{e}$$

where

L_i	=	the price-cost margin of firm i,
HHI	=	The Herfindahl-Hirschman index,
s_i	=	market share of firm i,
v_i	=	conjectural variation of firm i, and
e	=	demand elasticity.

See S. MARTIN (1993), ADVANCED INDUSTRIAL ECONOMICS (Blackwell 1993) ch. 2 at 167.

93. Table Thirteen presents the results of these estimations for Ameritech's entry into long distance in the region as a whole and for Michigan separately. For the region as a whole, assuming that incumbents maintain their now tacitly collusive practices, the index price decreases from $0.15 per minute (consistent with AT&T's *One Rate* plan) before entry to $0.112 after entry. The estimated post-entry price is consistent with Ameritech's post-entry market share, as well as with the redistribution of share most likely to occur. This price per minute reduction can however be accomplished in a number of ways. In place of a direct reduction in the post-entry price, improvements in the packaging of services, such as bundling local and long-distance, could yield new products valued sufficiently more by consumers to constitute a price-equivalent benefit. Alternatively, carriers may offer lower intrastate rates, free intraLATA toll service for a period of time; and/or free or discounted offers for such services as wireless, Internet access, satellite television service, and/or voice mail. Finally, carriers could extend further their current practice of offering cash payments to customers to induce them to switch carriers. There is no question but that interexchange carriers have a range of available competitive responses, some combination of which will be the actual outcome, and the net effect of those competitive responses is captured by the estimate of the post-entry price in the welfare model.

94. These post-entry market conditions bring about predicted increases in the quantity demanded from 37 billion conversation minutes to 44 billion conversation minutes. The consumer welfare gains that follow from these lower post-entry prices and larger quantities demanded are reported in the left-hand column of Table Fourteen.[52] The annual gain to

[52] The present value was evaluated in perpetuity with future, annual consumer benefits discounted at the social rate of discount of 8 percent. If the benefit calculation were made assuming the pre-entry price equaled $0.22 per minute (i.e., AT&T's actual price for its standard MTS service as of May 1, 1996), the annual welfare gain would equal $3.7 billion and the present value gain would equal $46.0 billion.

consumers is $1.5 billion for the region as a whole and $370 million for Michigan. These gains represent a substantial portion of the estimated $8.1 billion currently spent annually by consumers for interLATA calls originating or terminating within Ameritech's region.[53] The present value of the total annual benefit stream is $19.1 billion in the entire region and $4.6 billion in Michigan.

[53] Current annual expenditures are estimated from the pre-entry price per minute and number of U.S. conversation minutes reported in Table Thirteen.

TABLE THIRTEEN

KEY STATISTICS - AMERITECH REGION AND MICHIGAN

PRIOR TO AND FOLLOWING AMERITECH'S ENTRY INTO INTERLATA MARKET

	Pre-Entry	Post-Entry	
		All Carriers Price Non-Cooperatively	Entrant Prices Non-Cooperatively but Incumbents Tacitly Cooperate in Pricing
Ameritech Region Total:			
HHI	0.344	0.270	0.270
Price-Cost Margin	0.523	0.334	0.363
Price per Minute MTS ($)	0.150	0.107	0.112
Number of Conversation Minutes (billions)	37	46	44
Michigan:			
HHI	0.306	0.259	0.259
Price-Cost Margin	0.523	0.332	0.343
Price per Minute MTS ($)	0.150	0.107	0.109
Number of Conversation Minutes (billions)	8	10	10

Source: Pre-entry number of U.S. conversation minutes in the Ameritech region from FCC, STATISTICS OF COMMUNICATIONS COMMON CARRIERS, 1994/1995 Table 2.6.

C. *CONSUMER GAINS FROM ENTRY ASSUMING THAT ALL CARRIERS SET PRICES NON-COOPERATIVELY*

95. The alternative assumption is that Ameritech's entry causes a breakdown of tacitly collusive behavior on the part of the major long distance carriers, (i.e., all carriers act non-cooperatively following Ameritech's entry). By setting all conjectural variation terms at zero , the benefits are somewhat larger.[54] The standard plan price per minute of MTS service decreases to $0.107 while the quantity demanded increases to 46 billion conversation minutes. The consumer welfare gains that follow from these lower post-entry prices and larger quantities demanded are reported in the right-hand column of Table Fourteen.[55] The annual gain to consumers is $1.7 billion for the region as a whole and $388 million for Michigan. The present value of the total annual benefit stream is $21.9 billion in the entire region and $4.9 billion in Michigan.

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[54] When estimating the welfare benefits based on the assumption that Ameritech's entry causes a breakdown of tacit collusion, the conjectural variations for MCI and Sprint are reduced to zero. In contrast, AT&T's conjectural variation is held constant at -0.19 because that value already indicates non-cooperative behavior.

[55] The present value is estimated using a social rate of discount of eight percent and assuming that annual consumer benefits are realized in perpetuity.

TABLE FOURTEEN

CONSUMERS' WELFARE GAINS FROM AMERITECH'S ENTRY INTO INTERLATA SERVICES

	Entrant Prices Non-Cooperatively but Incumbents Tacitly Cooperate in Pricing	All Carriers Price Non-Cooperatively
Annual Consumer Gain		
Total Region	$1.5 billion	$1.7 billion
Michigan	$0.4 billion	$0.4 billion
Present Value of Consumer Gain		
Total Region	$19.1 billion	$21.9 billion
Michigan	$4.6 billion	$4.9 billion

96. These estimates of benefits lead to the inference that consumers will likely make large gains as a result of Ameritech's entry into in-region, interLATA services. Ameritech is positioned to offer an attractive service alternative whether or not it disrupts the current tacitly collusive price structure. There are possible qualifications to my estimates of the size of these gains, however, as a result of possible regulatory constraints. Prices resulting from Ameritech's entry could be constrained by the requirement in the *Telecommunications Act of 1996* that interexchange carriers charge the same price nationally for a given service. That is, interexchange carriers cannot offer the same interstate service at different prices in different

states. Thus, to the extent that this holds, the price reductions predicted here for interexchange carriers following Ameritech's in-region entry necessarily would be constrained or even reduced by requirements for parity. If Ameritech were the only RBOC to offer in-region, interexchange services, this could limit the price responses of current interexchange carriers, and thus reduce consumer welfare gains. However, Ameritech clearly will not be the only RBOC to offer in-region, interexchange services. Indeed, all six RBOCs will likely seek to offer new interexchange services, and although their entry will not be simultaneous, national interexchange carriers such as AT&T, MCI, and Sprint will have to respond to the combined effect of RBOC entry across all regions of the country. Therefore, the national rate schedule of incumbent carriers consistent with the *Act* but responsive to RBOC entry as a consistent series of regional occurrences, would not differ from that used to estimate gains in Table Fourteen. Thus Ameritech's entry provides customers with interLATA service that will redistribute market shares, causing price-cost margins for long-distance services to be driven down, or their equivalent, with the result that the economic welfare of long-distance consumers will be increased by more than $1.5 billion dollars annually.

VII. CONCLUSIONS

97. Consumers in Ameritech's service area would gain more than one billion dollars annually and nearly $400 million in Ameritech Michigan's service area annually as the direct result of its ability to offer in-region, interLATA services. Benefits of this magnitude should be treated seriously - they follow from realistic estimates of the gains to consumers in Ameritech's five-state region. These benefits would result from lower prices and improved service caused by Ameritech's entry, which would have the effect of increasing the

competitiveness of markets for telecommunications services purchased by consumers in Illinois, Indiana, Michigan, Ohio, and Wisconsin.

98. At present, consumers in these states pay above-competitive prices caused by tacitly collusive behavior on the part of major long-distance carriers. I have examined sets of hypotheses regarding market competitiveness and found the evidence to support the conclusion that long-distance carriers tacitly collude to maintain prices in excess of competitive levels. First, despite significant declines in market concentration over time, the major long-distance carriers have increased their price-cost margins during the past five years. Second, hypotheses of competition also are rejected based on the pattern of rising and uniformly high price-cost margins for different markets. These facts dispel any claim that AT&T, MCI, and Sprint offer consumers competitive prices for long-distance services.

99. Entry by Ameritech into long-distance service in its region is the most feasible way to address the lack of competition for these services. Significant consumer welfare gains can be expected from Ameritech's entry. My conservative estimates suggest that consumers' economic welfare would increase by $1.5 to $1.7 billion annually or $19 to $22 billion in present value due to lower service prices in Ameritech's five state service area. In Ameritech - Michigan's service area, the estimated improvements are $0.4 billion annually and $4.6 billion to $4.9 billion in present value. Such substantial consumer gains are ample evidence of entry in the public interest.

* * *

I hereby swear, under penalty of perjury, that the foregoing is true and correct, to the best of my knowledge and belief.

Paul W. MacAvoy

Paul W. MacAvoy

Subscribed and sworn to before me this 3rd day of December, 1996.

Mary McKenna

Notary Public

My commission expires: 2-10-99.

A

Appendix A

I. Introduction and Summary

1. The basic methodology of this study follows that presented in my recent book, THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-DISTANCE TELEPHONE SERVICES, (Cambridge, MA: MIT and AEI Press, 1996), which analyzed competitive performance in markets for interstate, long-distance telecommunication services. Several economists, working on behalf of AT&T or MCI, have criticized aspects of the methodology or findings presented in my book and earlier testimony.[1] Douglas Bernheim and Robert Willig (hereinafter "B&W") and R. Glenn Hubbard and William Lehr (hereinafter "H&L") have offered criticisms in their testimony on behalf of AT&T.[2] Recently, B&W produced a manuscript on competition in telecommunications that attempts to extend their earlier

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[1] Affidavit of Paul W. MacAvoy, UNITED STATES OF AMERICA v. WESTERN ELECTRIC COMPANY, INC., AND AMERICAN TELEPHONE AND TELEGRAPH COMPANY, Civ. No. 82-0192 (HHG), July 6, 1994 (hereinafter "MacAvoy Affidavit, July 1994"); Reply Affidavit of Paul W. MacAvoy, UNITED STATES OF AMERICA v. WESTERN ELECTRIC COMPANY, INC., AND AMERICAN TELEPHONE AND TELEGRAPH COMPANY, Civ. No. 82-0192 (HHG), May 1995 (hereinafter "MacAvoy Reply Affidavit, May 1995."

[2] Affidavit of B. Douglas Bernheim and Robert D. Willig, AN ANALYSIS OF THE MFJ LINE OF BUSINESS RESTRICTIONS, December 1, 1994, UNITED STATES OF AMERICA v. WESTERN ELECTRIC COMPANY, INC. AND AMERICAN TELEPHONE AND TELEGRAPH COMPANY, Civ. No. 82-0192 (hereinafter "Bernheim and Willig Affidavit, December 1994"); Glenn Hubbard and William H. Lehr, Attachment 1, AN ANALYSIS OF COMPETITION IN U.S. LONG DISTANCE TELEPHONE SERVICE, December 5, 1994, UNITED STATES OF AMERICA V. WESTERN ELECTRIC COMPANY, INC. AND AMERICAN TELEPHONE AND TELEGRAPH COMPANY, Civ. No. 82-0192 (hereinafter "Hubbard and Lehr Affidavit, December 1994").

criticisms, as well as address the findings in my book.[3] Likewise, Robert Hall's testimony, containing similar criticisms, has been cited by MCI.[4]

2. I focus on the most important comments of these analysts, which consist of eleven separate points. Four of these comments were made prior to the publication of my recent book and relate to evidence presented in my July 1994 Affidavit, while the remaining seven comments relate specifically to my recent book. Taking these eleven points in order, they may be summarized as follows:

1. My analysis of price-cost margins allegedly underestimates interexchange carriers' marginal costs and, therefore, overstates margins.

2. Firms reselling WATS or Combined Services allegedly prevent MTS prices from rising above competitive levels because WATS and Combined Services markets "are known to be" competitive.

3. My measure of MTS prices allegedly fails to account for price discounts and, thus, overstates prices and margins. B&W claim that carriers' average revenue per minute ("ARPM") provides a more accurate measure of MTS prices than actual tariff rates because ARPM accounts for discount service plans.

4. B&W claim that accounting and financial data should be used to measure the competitiveness of telecommunications markets instead of price-cost margins, since the latter allegedly is subject to large measurement error. They further allege that accounting and financial data show that long-distance markets are competitive.

5. My analysis of discount plans allegedly is flawed because it uses weights based on the percentages of customers having different monthly usage levels (i.e., different monthly bills). B&W claim that using weights based on the volume of minutes would be superior.

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[3] B. Douglas Bernheim and Robert D. Willig, THE SCOPE OF COMPETITION IN TELECOMMUNICATIONS, Working Paper Prepared for The American Enterprise Institute for Public Policy Research, October 25, 1996 (hereinafter "Bernheim and Willig 1996 Manuscript").

[4] Declaration of Robert E. Hall, December 2, 1994, UNITED STATES OF AMERICA V. WESTERN ELECTRIC COMPANY, INC. AND AMERICAN TELEPHONE AND TELEGRAPH COMPANY, Civ. No. 82-0192 (hereinafter "Hall Affidavit, December 1994").

6. B&W claim that my analysis of MTS rates is "transparently meaningless" because it ignores or mishandles discount plans.

7. B&W claim that AT&T's ARPM fell to $0.135 per minute by July 1995 on a volume-weighted basis, which allegedly shows the competitiveness of the market for MTS service.

8. B&W note that an implication of my theoretical framework is that price-cost margins should vary by market, but they claim that my research shows no such variation in margins.

9. B&W claim that representative prices for MTS customers should not combine prices for customers with different usage levels because "the market is segmented, and that one should properly expect different prices in different segments."[5]

10. B&W allege that the price-cost margin cannot be used to measure competitive performance in long-distance markets because average costs exceed marginal costs.

11. B&W claim that conditions in the long-distance telecommunications industry do not facilitate the exercise of tacitly collusive behavior.

3. This Appendix contains my responses to each of these claims. In brief, my responses can be summarized as follows:

1. Marginal costs for long-distance telecommunications carriers consist of access charges and network costs. The access costs reported in this affidavit and my book use the same access costs recommended by H&L: total switched access charges as reported by the FCC. My measure of network costs comes directly from the testimony of an AT&T cost expert, and is also substantiated by four other sources cited in the text of this affidavit.

2. The assertion that resellers ensure competition in the MTS market depends on the validity of the underlying assumption that WATS markets are competitive. But WATS markets are not competitive because they have the same pattern of rising price-cost margins and falling concentration that is evident for MTS services.

3. Interexchange carriers provide MTS services according to conditions in their tariffs. The presumption is that a carrier's actual charge for any

[5] Bernheim and Willig 1996 Manuscript, p. 59.

specific call and the tariff designation of charges for a call of that type have to be the same. That presumption does not exist for the relationship between a carrier's charge for any call and average revenue per minute on all calls. Moreover, examination of MTS margins after adjusting for price discounts, as reported in this affidavit and in my book, shows that margins for discount MTS services continue to rise at levels more than 90 percent of margins using standard MTS tariffs.

4. Price-cost margins directly measure the extent of a firm's market power. The accounting and financial data measures proposed by H&L and B&W are not meaningful measures of market power.

5. B&W's claim is a misunderstanding of my use of weights. According to B&W, I used all the monthly usage categories, including low-volume customers, when calculating weighted-average discount MTS prices. This is wrong. As explicitly stated in my book: "In some cases, low-volume usage levels caused prices to be higher under discount calling plans than under standard MTS. In those cases the discount prices *were excluded* from the weighted-average price calculation."[6] Thus, the weighted-average prices only used as weights those customers with usage levels large enough to gain from participation in the discount plan. For this reason, there is no surprise in finding that upon re-calculating the weighted-average discount MTS prices using B&W's preferred volume weights, no change in the observed pattern of rising price-cost margins occurs.

6. At least one-third of AT&T's customers cannot benefit from discount MTS plans. For these 21 million customers, AT&T's basic MTS rate is hardly meaningless. My analysis of discount MTS plans with index prices calculated in a manner similar to that used by the FCC also shows that the three large interexchange carriers have not used these plans to establish more competitive prices over this decade.

7. The validity of B&W's $0.135 per minute, volume-weighted, ARPM price is problematic because B&W do not reveal either their volume weights or the source of their data. They fail to recognize that AT&T's *One Rate* plan at $0.15 per minute constitutes a price increase - not a competitive pricing initiative.

8. B&W are simply mistaken in the claim that my research shows differences in price-cost margins for MTS, WATS, and Combined Services that

[6] MacAvoy, P. (1996), THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-DISTANCE TELEPHONE SERVICE, Cambridge, MA: MIT and AEI Press, p. 123, note 12 (emphasis added).

confound monopoly model hypotheses. That research shows no variation of margins with demand elasticity and concentration, but more important no tendency to converge on zero over time.

9. B&W's claim that the "market is segmented" constitutes an oxymoron. Products are either in or not in a market - there is no such concept as "segmented." If products such as telecommunications services are in the same market, they have the same price; and if they are not in the same market, they have different prices.

10. If B&W were correct that AT&T's average costs exceed its marginal costs, then the firm would be a natural monopoly. Their claim that price equals average cost was that of cost-of-service regulation; on that standard AT&T would or would not make a case for its return to cost-of-service regulation.

11. B&W are not correct regarding their claim that conditions in the long-distance industry do not support the exercise of tacitly collusive behavior. The price-matching behavior of the major long-distance carriers, coupled with their rising price-cost margins while concentration declined, clearly indicates their tacitly collusive behavior.

II. Responses to the Claims of Critics

A. Point One: The Analysis of Marginal Costs

4. The marginal cost of a long-distance telecommunications service equals the change in total cost caused by a small (literally infinitesimal) change in the output of these services. They can be separated into two different elements: access costs and network costs. Access costs are the costs paid by long-distance carriers to local exchange carriers for originating and terminating calls. Network costs are the costs of operating long-distance, fiber-optic telecommunications networks.

5. B&W's 1996 Manuscript summarizes the alleged flaws of my analysis of access charges as follows:

> MacAvoy's approach is to use the ratio of interstate access revenues to total switched access minutes, both of which are reported by the FCC. As Professors R. Glenn Hubbard and William H. Lehr have observed, there are a surprising number of

> pitfalls associated with this calculation. It should also be noted that MacAvoy's measure of access charges is similar in spirit to [average revenue per minute "ARPM"]. It is ironic that MacAvoy would reject ARPM as a measure of price because it is sensitive to changes in the composition of demand, while using a measure of costs that is sensitive to similar compositional changes (e.g., shifts in demand between states). Price-cost margins based on MacAvoy's data therefore involve apples-to-oranges comparisons.[7]

6. Unfortunately, B&W are fighting the last war. In my July 1994 Affidavit, I did indeed calculate access charges based on the ratio of (1) interstate access revenues to (2) total switched access minutes. But in both my May 1995 Reply Affidavit and my 1996 book, I used the same access charges as advocated by H&L: total switched access charges per conversation minute as reported by the FCC (see Figure Nine of this affidavit). Thus, the price-cost margins in my recent book, as well as this affidavit, are not "similar in spirit to ARPM," nor do they "involve apples-to-oranges comparisons." Both the marginal costs and prices are based on "apples-to-apples comparisons" of the actual charges per minute for access services and interLATA toll services.

7. Concerning dedicated service, H&L make the *ad hoc* assumption that dedicated access charges equal 25 percent of switched access costs. This allows them to report higher access costs for dedicated services. To assess the validity of H&L's *ad hoc* assumption, I examined the tariffed rates of Pacific Bell, a company for which data were available (see Figures Ten, Eleven, and Twelve of this affidavit).[8] The company's charges for dedicated access were

[7] Bernheim and Willig 1996 Manuscript, chapter two, pp. 82-83.

[8] The sources for all access cost information are as follows: Interstate MTS, Interstate WATS Switched (Outbound and Inbound), and Interstate WATS Dedicated (Outbound and Inbound - Open End of Call) are from FCC, Monitoring Report, 1994, Table 5.11; Interstate WATS Dedicated (Outbound and Inbound - Closed End of Call) are from Pacific Bell tariffs.

less than half the level assumed by H&L. Given that H&L's assumption conflicts with real data and has no other source justification, H&L's assumed dedicated access costs have to be rejected.

8. H&L further argue that in my July 1994 affidavit I underestimated "incremental network costs." These are the same cost estimates that form the basis for carrier price-cost margins in my book[9] and this affidavit. They suggest, based on a 1989 Bell Laboratories study of MCI's and Sprint's "incremental costs of lighting dark fiber," that long-distance carriers' "incremental network capital costs" could be as high as $0.023 per minute, rather than the $0.01 value used in my July 1994 affidavit and subsequent studies. This statement must come as a surprise to AT&T, since its own cost expert testified in June 1990 that AT&T's network costs for switched and dedicated WATS services (both inbound and outbound) ranged from $0.0101 to $0.0130 per minute (see Appendix A-Table One).[10]

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[9] *See* MacAvoy, P. (1996), THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-DISTANCE TELEPHONE SERVICE, Cambridge, MA: MIT and AEI Press, pp. 114-115.

[10] *Direct Testimony of John Sumpter on Behalf of AT&T Communications of California, Inc.*, June 18, 1990, *Application of AT&T Communications of California, Inc. (U 5002 C) for Authority to Provide Intrastate AT&T 800 READYLINE Service.*

APPENDIX A-TABLE ONE
AT&T ESTIMATES OF LONG-RUN
NETWORK COSTS FOR LONG-DISTANCE CALLS
(DOLLARS PER MINUTE)

WATS Outbound Switched	WATS Outbound Dedicated	WATS Inbound Switched	WATS Inbound Dedicated
Pro WATS	Megacom WATS	Ready Line 800	Megacom 800
$0.0101	$0.0130	$0.0108	$0.0129
Source: *Direct Testimony of John Sumpter on Behalf of AT&T Communications of California, Inc.*, June 18, 1990, *Application of AT&T Communications of California, Inc. (U 5002 C) for Authority to Provide Intrastate AT&T 800 READYLINE Service.*			

AT&T's estimates are slightly higher than those of Wharton Econometric Forecasting Associates (WEFA), which reports a network cost of service of $0.01 per minute, but AT&T's estimates are only one-half the value put forward by H&L.[11] Both in the research presented in my book and in this affidavit, I base marginal cost estimates on AT&T's operating costs for switched and dedicated WATS outbound and inbound services and WEFA's estimate of operating costs for MTS standard and discount services.

9. H&L further argue that "incremental" costs included in the price-cost margin should take into account something they call "production-sensitive customer-related marketing costs." Unfortunately, one cannot conclude from their report the extent to which marketing costs contribute to AT&T's marginal costs, since they do not offer any evidence as to the portion of marketing expenses that allegedly varies with marginal changes in total output.

[11] WEFA, ECONOMIC IMPACT OF ELIMINATING THE LINE-OF-BUSINESS RESTRICTIONS ON THE BELL COMPANIES (July 1993) (citing Bellcore data), pp. 20-21.

10. Moreover, the concept that *marketing expenses are marginal costs* is incorrect, as a matter of theory. Unlike raw materials costs that vary with output and are clearly marginal, there is no presumption that marketing expenses are marginal. Neither H&L nor B&W have provided any evidence to demonstrate that a specific part of AT&T's marketing costs are "production-sensitive" and as such vary with marginal changes in output. Instead, H&L offer data showing that AT&T's advertising expenses have increased since 1989 and claim this provides "another indication of the increasing competition for customers in long-distance markets. . . ."[12]

11. In making this claim, H&L contradict the most elementary oligopoly theory. As demonstrated over forty years ago, a firm's marketing expenses are determined by (1) how advertising shifts the demand function and (2) the level of price-cost margins. This is the well-known "Dorfman-Steiner" condition that characterizes firms' advertising expenditures.[13] The first determinant implies that the greater the increase in demand resulting from an increase in advertising outlays, the larger will be total advertising expenditures. The effect of the price-cost margin on a firm's advertising decisions is that the higher the margin, the more it pays to advertise. As firms' price-cost margins increase, so should advertising expenditures as a percent of sales revenues, the opposite of H&L's statement.

[12] Hubbard and Lehr Affidavit, December 1994, p. 7.

[13] *See* Dorfman R. and Steiner, P. (1954), *Optimal Advertising and Optimal Quality*, 44 AMERICAN ECONOMIC REVIEW 826; Telser, L. (1964) *Another Look at Advertising and Concentration,* 18 JOURNAL OF POLITICAL ECONOMY 85; and Martin, S. (1993), ADVANCED INDUSTRIAL ECONOMICS, Cambridge, UK: Blackwell Publishers, p. 137.

12. The research presented in my book, demonstrated that AT&T's price-cost margins increased over the period considered by H&L (i.e., 1989 to 1994).[14] Therefore, holding constant the first determinant, AT&T's advertising expenditures should have increased during this period because the second determinant, i.e., its price-cost margins, increased. Indeed, to explain AT&T's increased advertising expenditures as a "competitive" initiative (i.e., maintaining their claim that AT&T's profit margins have not increased), H&L should have shown that customers had become more responsive to advertising over time or that advertising elasticity of demand had increased. But they did not make that showing. The fundamental flaw of their analysis is that they have the oligopolistic decision process backwards. Rather than being an indication of increasing competition, more advertising expenditures as a percent of sales is a response to rising price-cost margins.

13. Finally, H&L claim that "another important incremental cost . . . is the allowance for uncollectible bills." H&L fail to offer any evidence that these costs have increased over time or vary with changes in AT&T's total service offerings. Moreover, they have confused costs and revenues. An allowance for uncollectible bills is not a marginal cost, but rather a reduction in revenues. If the allowance were to have any effect on the price-cost margin, it would occur through a reduction in "net" price (price received rather than charged, with the former the less because of non-payment per unit of sales). In fact, it is reasonable to presume that AT&T's charged prices incorporate a premium to cover a specific percentage of bills that are expected to go unpaid. That is, AT&T should not be continuously surprised by the fact it has uncollectible bills, but rather it takes these into

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[14] MacAvoy, P. (1996), THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-DISTANCE TELEPHONE SERVICE, Cambridge, MA: MIT and AEI Press, pp. 117-133.

account when setting its prices. The point is that AT&T's prices from the tariffs do not require adjustment for uncollectible bills.

14. H&L's claim that my cost estimates were subject to "bias . . . sufficient to refute the pattern of rising margins" can be evaluated using the marginal cost estimates shown in Figures Nine to Twelve and the access charges advocated by H&L. As shown in Figures Thirteen to Twenty of this affidavit, the comparison indicates consistent patterns of rising price-cost margins no matter whose costs are used in the construction of margins. Therefore, H&L's claim that the use of their stipulated marginal cost data could refute the pattern of rising margins has no basis.

B. Point Two: The Competitive Effects of Resellers

15. B&W claim "significant market power cannot exist" in the MTS market because firms reselling WATS, purchased in a "vigorously competitive" market, prevent AT&T, MCI, and Sprint from raising MTS prices above competitive levels. B&W state:

> . . . if Basket 3 services are competitive - which they are - barriers to entry in Basket 1 services are necessarily absent. Since competitive prices in bulk wholesale services closely mirror the costs of providing those services, non-facilities based entrants into Basket 1 services do not suffer from any significant economic handicap. Thus, economic logic inevitably implies that <u>Basket 1 services inherit the competitive characteristics of Basket 3 services</u>. To the extent that Basket 3 is vigorously competitive, significant market power cannot exist in Basket 1.[15]

Their claim fails because the markets for WATS and Combined Services are not competitive and, therefore, resellers cannot prevent facilities-based carriers from raising prices above the

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[15] Bernheim and Willig Affidavit, December 1994, p. 135 (emphasis in original). B&W repeat the claim in their 1996 Manuscript that since "bulk wholesale services" such as WATS and Combined Services are competitive, MTS is necessarily competitive. *See* Bernheim and Willig 1996 Manuscript, chapter two, pp. 33-34.

competitive level at wholesale which they and the same carriers pass on at retail. B&W's first step should have been to provide evidence regarding competitive performance of WATS and Combined Services markets. They never take this step.

16. In both this affidavit and my book, I have examined at length both standard and discount WATS prices as well as Combined Services prices available to large business customers. Standard WATS prices were calculated assuming a monthly usage level of 200 hours per month; discount WATS prices were examined by increasing monthly usage to 1,000 hours per month and by extending contract length from monthly to three years. There were two basic results. First, price-cost margins earned on standard and discounted WATS services and Combined Services exhibited the same pattern of rising margins in the 1990s. And the absolute level of these price-cost margins were at or near the level in standard MTS service. Rather than both sets of margins for WATS and Combined Services being the same, at prices equal to costs, both are the same at prices far in excess of marginal costs, as expected from collusion among suppliers.

C. POINT THREE: AVERAGE REVENUE PER MINUTE AS AN INDEX OF MARKET PRICE

17. H&L claim that "average revenue per minute" ("ARPM") yields a more "meaningful" measure of price than a price index constructed directly from the tariffs of any interexchange carrier.[16] There is no reason to expect that ARPM would better measure

[16] H&L do not specify how they determined AT&T's "average revenue per minute," which presumably equals total revenues attributed to a service divided by total minutes attributed to that service. For example, they do not define the different revenue sources that were included in one or the other of their calculations. It is not possible to know, for example, whether "average revenue per minute" for any of the services includes such irrelevant categories as revenues from non-recurring service order charges; customer charges for specialized hardware or software; revenues from the sale of cellular phones; revenues from international calls; revenues from operator surcharges; and many other revenue categories as well.

price on a transaction. Interexchange carriers provide MTS services for charges laid out according to conditions in their tariffs and their charges can be compiled accurately for any subscriber from FCC tariffs.[17] The presumption is that AT&T's actual charge for any specific call and the tariff designation of charges for a call of that type have to be the same. That presumption does not exist for the relationship between AT&T's charge for any call and its average revenue received per minute on all calls. Indeed, a simple test of my claim can be made by picking up a phone, placing a call on AT&T, and checking the resulting price as billed by that carrier. The price for that call will equal AT&T's tariff rate for calls of that type, but it will not equal except by coincidence for one call AT&T's ARPM. Since consumers' purchasing decisions are driven by the prices they pay, relevant price signals are provided by the prices reported in this affidavit and not by the carriers' revenue index numbers.

18. H&L argue that my analysis "systematically overstates actual prices by relying on tariff data instead of the more meaningful data on average revenue per minute."[18] They do not provide documentation for AT&T's estimates of "average revenue per minute" that can be subjected to an economic analysis, but instead report index numbers for (1)

The inclusion of such "fixed" or "special" revenue elements will likely cause the measured year-to-year change in ARPM to decline faster than the "true" level net of these revenue sources, since "fixed" and "special" charges have generally been decreasing. As a result, the time trend of ARPM reported by H&L is likely biased downward.

[17] As noted earlier, tariff data used herein and my book were obtained from HTL Telemanagement Ltd., a firm that makes a "market" in these data by advising businesses on which tariff offers the lowest costs given their particular calling profiles.

[18] Hubbard and Lehr Affidavit, December 1994, p. 18. In their 1996 Manuscript, B&W repeat H&L's claim that ARPM is a superior measure. *See* Bernheim and Willig 1996 Manuscript, chapter two, p. 80.

"Residential MTS" and "Business Long Distance," (2) "Other Outbound Business," and (3) "800 Service." They deduct access charges (shown in Table One of their report) and deflate the difference between ARPM and access charges by the Gross Domestic Price implicit price deflator. They conclude that the resulting figure shows "the decline in long-distance telephone prices exceeds the decline in access charges paid to the local-exchange carriers for each [of the three market segments]."[19]

19. H&L's use of ARPM to measure the "prices" of all AT&T's MTS, WATS, and 800 services does not hold constant other factors that cause the index to fall besides the price. H&L made no attempt to control for changes in (1) the total size of customers' monthly bills; (2) the distribution of calls by day, evening, and night/weekend; (3) the distribution of calls by mileage; and (4) the average number of minutes per call. But all of these factors affect the price of making an MTS phone call without constituting a reduction in the price level of all calls. If, for example, customers' monthly usage levels increased, then ARPM would tend to fall. By way of illustration, suppose an AT&T customer's usage were to increase from a monthly bill of less than $10 to a higher amount, thus that customer's price per minute might be lowered by changing from AT&T's basic MTS service to its *Reach Out America* plan. This would lower AT&T's ARPM even if the prices of its basic MTS and *Reach Out America* services remained unchanged. Thus, as the mix of customers in the standard and discount MTS plans changed over time, and subscribers' usage increased, relatively larger customers moved to volume discount plans and the ARPM had to decline even if rates for the separate plans stayed the same.

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[19] Hubbard and Lehr Affidavit, December 1994, p. 13.

20. Similarly, if the distribution of calls changed to include relatively fewer day calls, ARPM would fall. If calls tended to be made for shorter distances, or if the average number of minutes per call increased, ARPM would fall. Without adjusting the index to hold the effects of these determinants constant, the resulting time series cannot be used to infer that the market has become more or less competitive.

21. B&W attempt to dismiss the significance of these types of irrelevant changes in the characteristics of calls on ARPM by claiming they are quantitatively insignificant, or in their words, ". . . of little practical consequence."[20] They claim that ". . . the hypothesized problem is only a theoretical possibility," yet they offer no evidence on the problem's quantitative significance.[21] Earlier in their 1996 Manuscript, while discussing the extent of discount plans, they recount in detail that customer participation in AT&T discount plans has grown rapidly in the 1990s, with even higher rates of participation for MCI and Sprint customers.[22] Such large customer shifts to discount plans must lead to decreases in ARPM even though standard and discount plan prices remain unchanged.

22. Finally, although H&L did not provide data on AT&T's ARPM, the letter of Mr. Mandl to Chairman Hundt included estimates of ARPM. An attachment to Mr. Mandl's letter reported AT&T's ARPM for "Interstate (Switched)" calls, without defining what services are included in that category. I assume, *arguendo*, that this crude measure can be used as an index price for representative MTS service. By using the data in Mr. Mandl's

[20] Bernheim and Willig 1996 Manuscript, chapter two, p. 78.

[21] Bernheim and Willig 1996 Manuscript, chapter two, p. 78.

[22] Bernheim and Willig 1996 Manuscript, chapter two, pp. 56-57.